

REMARKS

Claims 1, 54, 63 and 67 have been amended. New claims 85-86 are added. Claims 1-7, 51-74 and 85-86 remain in the application for consideration. Reconsideration of the application in view of the amendments and the remarks to follow is requested.

Figure 3 is amended to correct a typographical error. Support for the correction is disclosed at page 6 of the originally-filed application and Figure 2.

Claims 1-7 and 51-74 stand rejected under 35 U.S.C. §102(e) as being anticipated by Liaw et al. (5,960,276).

Claim 1 recites forming a plurality of shallow trench isolation regions to define a plurality of active areas having widths, at least two of the widths being different. Claim 1 is amended to further recite transistors corresponding to the active areas having the different widths having different threshold voltages, and wherein a smaller of the different widths has a lower of the different threshold voltages. The amendment language is supported by the originally-filed application by exemplary embodiments of the invention being described at, for example, pages 6-7. Liaw does not teach or suggest the smaller of the different widths (of the active areas) has the lower of the different threshold voltages. In fact, Liaw teaches just the opposite, that is, the larger channel lengths have lower threshold voltages. The Examiner relies on a table of Liaw at col. 4, lines 7-28, and Fig. 4 to allegedly teach a relationship between different widths of the active areas and threshold voltages of claim 1 (pg. 2 of paper no. 24). The Table discloses, for example, a channel length equaling 20 μm (with a Boron implant

and a channel width $0.6\ \mu\text{m}$) has a threshold voltage of 0.703. For comparison, a channel length equaling $0.35\ \mu\text{m}$ (with the Boron implant and the channel width of $0.6\ \mu\text{m}$) has a threshold voltage of 0.758. That is, as the channel length (corresponding to the active area width) increases, the threshold voltage decreases. This is an opposite teaching to the claim 1 recitation to a **smaller of the different widths** (of the active areas) has a **lower** of the **different threshold voltages**.

Moreover, the Examiner relies on Fig. 4 of Liaw to allegedly teach a relationship between different widths of the active areas and threshold voltages. The topmost graph line of Fig. 4 represents a channel length equaling $0.35\ \mu\text{m}$ (with the implants) wherein the next topmost graph line (immediately below the topmost graph line) represents a channel length of $20\ \mu\text{m}$ (with the implants). Since the $0.35\ \mu\text{m}$ graph line is positioned **above** the $20\ \mu\text{m}$ graph line, the $0.35\ \mu\text{m}$ graph line has the **larger threshold voltages** (the threshold voltages being provided on the y-axis). Accordingly, this graph represents that the **smaller channel lengths** have the **larger threshold voltages**. That is, as the channel length increases, the threshold voltage decreases. This is an opposite teaching to the claim 1 recitation to the **smaller of the different widths** (of the active areas) has the **lower** of the **different threshold voltages**. Accordingly, it is inconceivable that Liaw suggests or teaches the smaller of the different widths has the lower of the different threshold voltages as positively recited in claim 1.

Since Liaw fails to teach or suggest a positively recited limitation of claim 1, claim 1 is allowable.

Claims 2-7, 51-53 and 85 depend from independent claim 1, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

For example, claim 2 recites transistors having different widths, and providing the different threshold voltages **without** using a separate channel implant for the transistors. Liaw is completely devoid of any details regarding providing the different threshold voltages let alone the specifically recited claimed language of providing the different threshold voltages **without** using a separate channel implant for the transistors. Liaw teaches, “[i]n a key step, a large, angled Boron implantation is performed into the sidewalls and bottom of the trenches forming Boron doped regions 44 in the substrate” (col. 3, lines 34-36). That is, Liaw teaches implanting trenches to control the reverse narrow width effect (col. 1, lns. 36-41). Liaw is completely devoid of any teaching or suggestion to channel implant for the transistors. The Examiner states that such limitation of claim 2 is taught by Liaw at table 1 and Fig. 4 of the reference (page 2 of paper no. 24). The Table and Fig. 4 are representations of threshold voltages based on different channel lengths and widths (and with or without the Boron doped regions 44). That is, neither the Table or Fig. 4, in any fair or reasonable interpretation, teaches or suggests channel implants for transistors.

Therefore, it is inconceivable that Liaw teaches or suggests providing the different threshold voltages without using a separate channel implant for the transistors as positively recited in claim 2. Since Liaw fails to teach a positively recited limitation of claim 2, such claim is allowable.

Dependent claim 53 recites three individual transistors being configured to be coupled in parallel. Liaw is completely devoid of any teaching to transistors being configured to be coupled in parallel. An electronic search of the reference verifies the same. The Examiner relies on Fig. 3B to allegedly teach such limitation (page 4, of paper no. 24). However, 3B only illustrates one row of a pair of active areas having a common gate 40. The common gate 40 is not a teaching to transistors being configured to be coupled in parallel. Respectfully, without further teachings, there is no reasonable interpretation of Liaw to suggest three individual transistors being configured to be coupled in parallel as positively recited in claim 53. Since Liaw fails to teach or suggest a positively recited limitation of claim 53, claim 53 is allowable.

Independent claim 54 is amended to recite a transistor with a lower one of the threshold voltages corresponds to the active area having a smaller one of the widths. The amendment language is supported by the originally-filed application by an exemplary embodiment of the invention described at, for example, pages 6-7. Liaw teaches transistors with the lower threshold voltages have the greater channel lengths (active areas widths) (see table in col. 4 and Fig. 4). This is the opposite teaching to the claim 54 recitation to a transistor with a low r one of the threshold voltages **corr sponds** to the active area

having a **smaller** one of the widths. Accordingly, it is inconceivable that Liaw could teach or suggest the positively recited limitation of claim 54. Since Liaw fails to teach or suggest a positively recited limitation of claim 54, claim 54 is allowable.

Claim 54 also recites transistors being provided with the different threshold voltages without using separate channel implants. Liaw is completely devoid of any teachings to implanting transistors and teaches, “[i]n a key step, a large, angled Boron implantation is performed into the sidewalls and bottom of the trenches forming Boron doped regions 44 in the substrate” (col. 3, lines 34-36). That is, Liaw teaches implanting trenches **and not transistors**. For this additional reason, claim 54 is allowable.

Claims 55-62 depend from independent claim 54, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Independent claim 63 recites transistors corresponding to the active areas having the different widths having different threshold voltages without using a separate channel implant for the transistors. Liaw is completely devoid of any details regarding providing the different threshold voltages let alone the specifically recited claimed language of transistors corresponding to the active areas having the different widths having different threshold voltages without using a separate channel implant for the transistors. Liaw teaches, “[i]n a key step,

a large, angled Boron implantation is performed into the sidewalls and bottom of the trenches forming Boron doped regions 44 in the substrate” (col. 3, lines 34-36). That is, Liaw teaches implanting trenches to control the reverse narrow width effect (col. 1, lns. 36-41). Liaw is completely devoid of any teaching or suggestion to not using a separate channel implant for the transistors. Therefore, it is inconceivable that Liaw teaches or suggests transistors corresponding to the active areas having the different widths having different threshold voltages without using a separate channel implant for the transistors as positively recited in claim 63. Since Liaw fails to teach or suggest a positively recited limitation of claim 63, such claim is allowable.

Claims 64-66 and 86 depend from independent claim 63, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

Independent claim 67 is amended to recite a transistor with a lower one of the threshold voltages corresponds to the active area having a smaller one of the widths. The amendment language is supported by the originally-filed application by an exemplary embodiment of the invention described at, for example, pages 6-7. Liaw teaches transistors with the lower threshold voltages have the greater channel lengths (active areas widths) (see table in col. 4 and Fig. 4). This is the opposite teaching to the claim 67 recitation to a transistor with a lower one of the threshold voltages corresponds to the active area


having a small r one of the widths. Accordingly, it is inconceivable that Liaw could teach or suggest the positively recited limitation of claim 67. Since Liaw fails to teach or suggest a positively recited limitation of claim 67, claim 67 is allowable.

Claims 68-74 depend from independent claim 67, and therefore, are allowable for the reasons discussed above with respect to the independent claim, as well as for their own recited features which are not shown or taught by the art of record.

This application is now believed to be in immediate condition for allowance, and action to that end is respectfully requested. If the Examiner's next anticipated action is to be anything other than a Notice of Allowance, the undersigned respectfully requests a telephone interview prior to issuance of any such subsequent action.

Respectfully submitted,

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